

## GETTING TO KNOW OUR SOLAR SYSTEM

# Getting to Know Our Solar System

This teaching unit consists of a series of activities and lesson plans, which guide students through a study of the Sun, Space Weather as it affects the Earth and other planets. Throughout the unit teachers will be able to adapt the lessons to their own students as appropriate.

The unit begins with an introduction to the varied missions conducted by the National Aeronautics Administration (NASA) to study space weather phenomena. Our quest to understand how the Sun affects the rest of the Solar System begins with a lesson about the Sun, the source of space weather. Following lessons continue building an understanding of the Sun as the source of energy in the Sun-Earth system and then move outward into space, looking at plasma and ions, the magnetosphere, auroras, problems created on the Earth by solar storms, solar wind data analysis, and development of craters on Mars.

The Sun has a complex structure. The teacher may wish to briefly study the various layers/structures of the Sun, but the main focus of this unit is on CMEs (Coronal Mass Ejections), Solar Wind and the Plasma ejected from the Sun. Activities and lessons are included to build an understanding of differences in the various bodies of the Solar System.

Student interest can be engaged through the use of visual images followed by brainstorming and discussion. Numerous web sites are available with photos that can be used with this unit plan. They contain satellite images and ground-based photos of aurora and a number of excellent graphics. The "Internet Resources" section has a list of sites with numerous photos of aurora. Movie clips are available on some sites as well.

After viewing images, students should conduct a 'brainstorming' session. This enables them to discuss what they already know and alerts the teacher to misconceptions students have about the Sun and the Solar System. Hopefully, misconceptions will be changed as students learn more about the Sun, Space Weather, Aurora, and about special features on some of the planets.

When the 'brainstorming' sessions reach a natural conclusion, the class should categorize the ideas gleaned from the session. Divide the students into small groups and assign a category to each group. Have the groups organize the information making a concept web (*Inspiration* or some other graphic organizing software can be used to make a web of the ideas). Hang these documents up in the room. They can be referred back to as the unit of study progresses.

This unit can be used as a complete teaching unit, or as individual lessons. Also included are additional resources and suggestions for expansion of the lessons/unit.

There are several presentations prepared by Los Alamos Space Physicists for the LASSO Space Science Outreach 2003 Teacher's Workshop which you may find helpful: *Aurora*, *Solar Wind*, *Space Weather*. These may be downloaded from the LASSO web site (<http://education.lanl.gov/programs/lasso>).

Documents in the Appendix Section of this unit, provide additional information for the teacher and/or the students. If you are interested in more background material, you can view a PDF file of photos and drawings of the structure of the Sun in the Resources section found on the LASSO web site.